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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/428,125	10/26/1999	VISHNU K. AGARWAL	MI22-1299	4264

21567 7590 01/17/2003

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EXAMINER

ROSE, KIESHA L

ART UNIT PAPER NUMBER

2822

DATE MAILED: 01/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/428,125

Applicant(s)

AGARWAL ET AL.

Examiner

Kiesha L. Rose

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 38,42,43 and 46-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 38,42,43 and 46-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 10-12/17 6) ☐ Other:

DETAILED ACTION

This Office Action is in response to the RCE filed 10 December 2002.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 38, 46 and 51-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsuda et al. (U.S. Patent 6,143,597).

Matsuda discloses a capacitor (Fig. 1d), which contains a lower electrode (2) and an upper electrode (4) with two $\text{SrBi}_2\text{Ta}_2\text{O}_9$ dielectric layers (5,8) formed there between on an entire capacitor dielectric region consisting of essentially the composite of the two dielectric materials. The two dielectric layers are crystalline and since the dielectric layers are made from the same material they will have the characteristics that make the crystalline layers have a lateral shift in grain boundaries from one layer to the other with one of the dielectric layers has a thickness from 10% to 90% of the combined thickness.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 42 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda in view of Roh (U.S. Patent 5,783,253).

Matsuda discloses all of the limitations except for the dielectric materials to be of a titanate compound. Whereas Roh discloses a capacitor (Fig. 1e), which contains a first electrode (4) and a second electrode (8) with two immediately juxtaposed and contacting barium strontium titanate (BST) dielectric layers (6, 7). The two dielectric constants are formed of BST because they consist of high dielectric constants, which improve the capacitor device. (Column 3, lines 1-3) Since Matsuda and Roh are both from the same field of endeavor, the purpose disclosed by Roh would have been recognized in the pertinent art of Matsuda. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the capacitor of Matsuda device by incorporating two dielectric layers made of a titanate compound because it has a high dielectric constant which improves the capacitor device as taught by Roh.

Claims 43 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda in view of Fujii et al. (U.S. Patent 5,661,319).

Matsuda discloses all of the limitations except for the dielectric layers to be Ta₂O₅. Whereas Fujii discloses a capacitor (Fig. 1) with two dielectric layers formed of Ta₂O₅. Instead of the dielectric layers being made both of titanate compounds they can both also be made of tantalum pentoxide. Having both of the dielectric layers made of

tantalum pentoxide allows them to act as a diffusion barrier, which prevents the diffusion of silicon into the dielectric film. (Column 3, lines 47-53) Since Matsuda and Fujii are both from the same field of endeavor, the purpose disclosed by Fujii would have been recognized in the pertinent art of Matsuda. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the capacitor of Matsuda device by incorporating two dielectric layers made of tantalum pentoxide to prevent the diffusion of silicon into the dielectric film as taught by Fujii.

Claims 49, 50 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda as applied to claims 38 and 51 above, and further in view of Park et al. (U.S. Patent 5,780,115).

Matsuda discloses all of the limitations except for one of the electrodes to comprise titanium nitride. Whereas Park discloses a capacitor (Fig. 3) that contains titanium nitride electrodes (15/19) with a dielectric layer (17) therebetween. The electrodes are made of titanium nitride in order to reduce the oxide grown between the electrode and dielectric layer therefore reducing the thickness of the dielectric material. (Column 1, lines 51-65) Since Matsuda and Park are both from the same field of endeavor, the purpose disclosed by Park would have been recognized in the pertinent art of Matsuda. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the capacitor of Matsuda device by incorporating one of the electrodes to be titanium nitride to reduce the oxide grown between the electrode and dielectric layer therefore reducing the thickness of the dielectric material as taught by Park.

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Respons to Arguments


Applicant's arguments with respect to claims 38, 42-43 and 46-53 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is 703-605-4212. The examiner can normally be reached on M-F 8:30-6:00 off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


KLR
January 8, 2003


AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800